

Sustainability actions undertaken by higher education institutions in the Sierra Norte of Puebla, Mexico

Acciones de sostenibilidad emprendidas por instituciones de educación superior en la Sierra Norte de Puebla, México

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Abstract

Undertaken actions sustainability by Higher Education Institutions in the Sierra North of Puebla, Mexico. Taking the perspective of sustainable development as a framework, we intend to know the actions That Have Been Undertaken to date by the Institutions of Higher Education in the Sierra North of Puebla. In order to Strengthen the Initiatives That Contribute to the different levels of government, the productive sector, the economy That drives, and society in General to Contribute to the sustainable conservation of the environment. For This purpose, a quantitative empirical study was Conducted through a field research instrument to Identify different topics: such as rules or rules That Please beneficial policies around sustainability, ways of Local addressing problems, Initiatives to Promote Sustainability, application concrete sustainable practices and benefits That Have Been generated inside and outside the Institutions of Higher Education in the Sierra North of Puebla.

Sustainability, Education, Development, Globalization

Resumen

Acciones de Sustentabilidad emprendidas por Instituciones de Educación Superior en la Sierra Norte de Puebla, México. Teniendo como marco la perspectiva el desarrollo sustentable se pretende conocer las acciones que han sido emprendidas a la fecha por las Instituciones de Educación Superior en la Sierra Norte de Puebla. Con la finalidad de fortalecer las iniciativas que coadyuven a los distintos órdenes de gobierno, al sector productivo que impulsa la economía, y a la sociedad en general para así contribuir a la conservación sustentable del medio ambiente. Para tal efecto se realizó un estudio empírico cuantitativo mediante un instrumento de investigación de campo para identificar distintas temáticas como las normas o reglas que favorezcan políticas benéficas entorno a la sustentabilidad, las formas de atender problemáticas locales, iniciativas para el fomento de la sustentabilidad, aplicación concreta de prácticas sustentables y los beneficios que se han generado al interior y al exterior de las IES en la Sierra Norte de Puebla.

Sustentabilidad, Educación, Desarrollo, Globalización

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Introduction

Some economic activities have generated negative effects on the environment and these have been produced by processes obsolete several companies manufacturing, which has caused these companies to invest resources to prevent environmental accidents and use cleaner technology; Yet the social demands of the locality are not enough to make the necessary synergy that achieves a change of pattern of different behavior than is currently perceived violates environmental and social to generate poverty, to meet specific economic interests environment is generated.

They arise voices that shape the sustainability idea and is defined in the Brundtland Report (1987) "make development sustainable, durable, ie ensure that present needs are satisfied without compromising the ability of future generations to meet Own".

The importance of achieving a balance between social, economic and environmental factors is evident, so that the study an approach to sustainability is realized and as contextualized concept development today.

Knowledge are transformed into freedom of thought and are transmitted at universities that allow cognitive development of individuals, so also sustainability education is integrated and similarly the actions undertaken in the institutions analyzed Higher education in Mexico.

HEIs to become promoters of cultural property to help improve the reality of our country and the progress of society, also make commitments to perform functions that promote action around sustainability, and the main objective efforts will be analyzed to they have been made in the Sierra Norte of Puebla.

Approach to Sustainability

Vertiginous changes interconnected world through new technologies that indicate patterns of progress within the current globalization context has been characterized by a steady increase of inputs and raw materials to meet market demand regardless of the deterioration of natural resources for obtaining, by developed nations that claim to settle debts that have acquired developing countries which has led to an environmental imbalance that result is reflected in the breakdown of potential development in some countries has increased poverty and natural resources have been degraded, becoming increasingly notorious for the capitalist mode of production, according to the statement made by Keynes (1965) "The main drawbacks of the economic society in which we live are its failure to ensure full employment and its arbitrary and inequitable distribution of wealth and income".

Given the obvious drawbacks of capitalism he begins to create awareness of its importance in the environmental issues currently facing, about Diamond (2006) sets out the most serious environmental problems that both societies past and present highlighting met:

- a) accelerated destruction of natural habitats.
- b) Sources of food from the sea are not managed properly.
- c) An important part of wild species, has disappeared.
- d) Erosion by water and wind sweeping floors farmland.
- e) The main sources of energy in the world, especially in industrial societies, are fossil fuels.
- f) Most of the freshwater rivers and lakes in the world is already being used for irrigation, domestic and industrial uses.
- g) The chemical industry and many other discharged into air, soil, oceans, lakes and rivers toxic chemicals many products.
- h) Human activity produces gases escaping into the atmosphere, ozone deterioration.

i) The world population is increasing. Which in turn demands more food, space, water, energy and other resources.

j) What matters is not only the number of people but their impact on the environment.

Moreover, the awareness of individuals about the impact associated with the development in the natural environment to obtain resources begin to notice since the 70's with studies by Meadows, DH; Meadows, DL; Randers, J; Behrens, W. in 1972 (Zapiain, 2002) that determined the following: "If industrialization, pollution, food production and resource depletion maintain the present growth trends in world population, this planet will reach the limits its growth over the next hundred years. The most likely outcome would be a sudden and uncontrollable decline in both population and industrial capacity. "

Another action that reinforces the importance of the environment as one of the factors allowing development was addressed at the United Nations Conference on the Human Environment in Stockholm 1972 as the Program United Nations Environment Program (UNEP) presented, strengthening implicitly to the principles of sustainable development, also establishing on June 5 as world environment day.

Similarly in the early 80's much emphasis was placed on environmental education to raise awareness about the environment as it is closely linked to development and to improve the economic position, actions and practices that deplete natural resources are made that developed countries have committed resources and developing countries should overexploit to fulfill their financial obligations to those; situation described in Brundtland (1987, p. 23) "report is in the hands of humanity to make development sustainable, durable, ie ensure that present needs are satisfied without compromising the ability of future generations to meet their own. "

Thus, the concept of sustainable development begins to take shape and is ratified at the United Nations Conference on Environment and Development (UNCED) held in 1992 in Rio de Janeiro, Brazil (Earth Summit).

Date	Event
1948	Universal Declaration of Human Rights.
1972	United Nations Environment Program. Earth program.
1987	Brundtland report Our Common Future.
1989	Children's rights convention.
1990	Jomtien World Declaration on Education for All.
1992	Rio Declaration on Environment and Development. (Agenda 21).
2000	Dakar Framework for Action Fulfill common commitments.
2002	World Summit on Sustainable Development in Johannesburg.
2003	United Nations Decade of Literacy. Ministerial Round Table on Quality Education.
2004	United Nations Decade of Education for Sustainable Development.
2005	Millennium Project of the United Nations.
2009	Convention within the framework of the United Nations on Climate Change (UNFCCC).
2015	the Man and the Biosphere Program (MAB)

Table 1 Historical Sustainability term line *Source: self made*

In Table 1 it can be noticed in a historical line the various documents and agreements that contextualize the development of the concept of sustainability, and education and human development strategies at international level.

Integration of Sustainability to Education

Sustainable development from the covenant of strategies to make education, environmental education (IEO, 1999), and the Declaration of the Millennium Development Goals (UNDP, 2000), to evaluate them when they become the targets Sustainable Development (ODS), and in which a group of goals synthesized in 17 global targets, where quality education framed in the fourth objective aims are set: Ensure an inclusive, equitable and quality education and promotion opportunities learning throughout life for all. (UNDP, 2015); these actions become references observe that countries seek to strengthen environmental education to improve the quality of life without compromising that of future generations.

So that Education for Sustainable Development is a call to different movements such as environmental education, global education, economic education, development education, multicultural education, education for conservation, outdoor education, education and other global change. Education for sustainability is considerably broad and covers many aspects of these different approaches mentioned that are already established and have widespread acceptance. (Leal Filho et al., 1995).





	<p>1973-1992 Under the influence of the results of the Stockholm Conference, UNESCO established the United Nations Program for Environment (UNEP). Its mission leadership and encourage partnership in caring for the environment by inspiring, informing and enabling nations and peoples ways of improving the quality of life without compromising that of future generations.</p>
	<p>1994-1998 The movement of Education for Sustainability (ES) started gaining momentum in the early nineties, shortly after the Rio Conference. The movement has driven the reach of more traditional approach to environmental education, thanks to the inclusion of various interest groups in society such as business, industry, government, communities, foundations and teaching.</p>
	<p>2005-2014 Given the serious situation of poverty, violence, inseguridad and depletion of natural resources, the United Nations proclaimed the Decade of Education for Sustainable Development. (DESD). It aims to integrate the principles, values and practices of sustainable development into all aspects of education and learning, with the aim of promoting behavioral changes necessary to preserve the future.</p>
	<p>2015-2030 Global Action Program (GAP) for its acronym in English for ESD, the program that follows up the Decade of ESD (2005-2014). Reorienting education and learning so that everyone can acquire knowledge, skills, values and attitudes that empower and enable them to contribute to a sustainable future.</p>

Table 2 Global environment commitments Sustainability in Education.

Source: self made.

Table 2 shows the main global commitments that have been generated by the perception of changes in the natural environment and its effects on social and economic spheres are integrated. In order to generate changes in human behavior that allow the preservation of the environment and a sustainable future.

In this context is how the institutions of Education Superior (IES) assume global demands in training people and anticipating changes in regulations of Mexico and initiatives to institutionalize environmental perspective and sustainability in higher education (Nieto, 2007) and incorporated into the Mexican Consortium of University environmental programs for Sustainable Development (COMPLEXUS), which was aimed to promote and strengthen programs and strategies of institutional scope for incorporating environmental perspective and sustainability mission, political and academic programs through structural changes and strategic actions impact in the short, medium and long term (Súcar and Nieto 2004).

Actions for Sustainability in Higher Education in Mexico

As part of the National Development Plan 2013 - 2018, it is reflected on the importance of sustainable development and the effects of climate change and environmental degradation are perceived with greater intensity being generated loss of life and economic damage, equally recognized that country growth continues closely related to activities that generate depletion and environmental degradation, so must propitiate actions to reverse the new environmental conditions prevailing today, a new behavior pattern aligned sustainability.

Addressing global commitments representing various UNESCO programs to promote Education for Sustainable Development and the Decade of the United Nations Education for Sustainable Development, in 2002 the Mexican Consortium Program was created University for Sustainable Development (Complexus) under the auspices of the Center for Education and Training for Sustainable Development (CECADESU) of the Ministry of Environment and Natural Resources (SEMARNAT) and the Anuiés environmental, (ANUIES). Originally this consortium was integrated by 15 higher education institutions that offer environmentally focused institutional programs.

From its inception until 2017, the consortium has promoted various activities in which institutions freely and without restrictions are integrated, it should be noted that recently (March 2017) held a national meeting of curriculum greening intended to reorient plans and curricula to mainstream sustainability, to strengthen academic activities that promote environmental stewardship and sustainability as well as adjust their programs to a process for creating high quality and promote the development of the four pillars of Education for all : learning to know, learning to do, learning to live together and learning to be (Delors et al, 1996).

The elements that are an inherent part of sustainability point to visualize the environmental, social and economic issues as part of a whole and not in isolation, just as local action to solve problems must be done with a global vision and can lead to consequences world, should also be considered that personal consumer choices impact on resource extraction and manufacturing processes from distant places. As part of this context is sought documentary evidence that higher education institutions in Mexico are formally adopting some of the guidelines included in the Source Book for Higher Education UNESCO,

IES in the Sierra Norte de Puebla.

In this study, we are considering only the Higher Education Institutions (IES) of the Sierra Norte de Puebla as directly involved as a tool for human capital formation in the productive sphere, representing the ultimate learning for life productive in the social and economic sphere of graduates.

According to the Regional Development Program 2011-2017 Sierra Norte region. This region of the State of Puebla is composed of 35 municipalities and 1,532 localities, of which 1,503 representing 98.1% of rural localities with fewer than 2,500 inhabitants and concentrated to 411.746 inhabitants, ie 61.5% of the total in the region. The remaining 29 seats are over 2,500 urban inhabitants and together has 257.113 inhabitants, representing 38.5% of the total population. Huauchinango is a town in the region with more than 50,000 inhabitants.

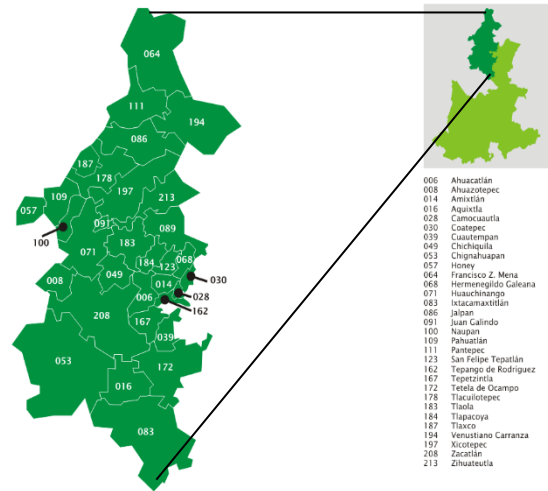


Figure 1 Municipalities that make up the Sierra Norte of Puebla. Source: Wikipedia File: MX-PUE-Huauchinango.png

Methodology

For its development a measuring instrument consisting of a direct questionnaire of 10 items forming indicators of knowledge and policies implemented to recognize the actions taken around sustainability in higher education institutions in the Sierra Norte of Puebla was applied, it should be noted some questions relate to the variable quality, which coincides with the methodology map competitiveness American Development Bank (IDB): planning, accounting and finance, management, quality, human resources, information technology and communication. statistical sampling was not applied under the universe it was limited to the Sierra Norte and applied to all IES, found in the aforementioned demarcation.

For the study 29 closed questionnaires of which 21 were appointed to public institutions and 8 dedicated to private institutions, a total of 29 higher education institutions in the region referred to above were applied.

Higher Education Institutions in the Sierra Norte de Puebla		
Municipality	Private IES	Public IES
Ahuacatlán	1	0
Ahuazotepec	0	1
Aquixtla	0	1
Chignahuapan	0	3
Honey	0	1
Francisco Z. Mena	0	1
Huauchinango	1	5
Ixtacamaxitlán	0	1
Olintla	0	1
Pahuatlán	0	2
Pantepec	0	1
Tetela de Ocampo	1	1
Xicotepec	1	2
Zacatlán	4	1
Subtotal:	8	21
Total:	29	

Table 3 Universities in the municipalities of the Sierra Norte de Puebla that direct questionnaires were applied. *Source: self made*

The variables and indicators that were structured to collect field data are presented as follows:

Variables	Indicators	Question number
Part 1: Overview	IES name of the respondent; name and hierarchical level in the Institution of interviewee, date, e-mail and telephone.	Header
Part 2: Understanding Sustainability	Knowledge and meaning of the term sustainability	one
Part 3: Application of Sustainability	Implementation of sustainability in the institution represented; considered if it involves social responsibility of the institution in addressing local and regional issues; existence of standards or rules that allow the development of policies for the benefit of sustainability.	2,3,4

Part 4: Actions for Sustainability	Knowledge of initiative or activity that promotes sustainability, benefit to the institution that represents and kind actions taken.	5,6,7,8
Part 5: Participation/ Collaboration	Degree of participation of students and staff in sustainability actions undertaken in the institution.	9,10

Table 4 Measuring instrument *Source: self made.*

Results

In the section Understanding Sustainability, the result reflects the following: 100% of the surveyed universities know the meaning of the term sustainability, so universities in the Sierra Norte de Puebla takes into account the importance it represents sustainability.

In implementing sustainability 100% of the institutions surveyed if they can perform the implementation of sustainability. However only 67% of universities have rules or rules for the benefit of sustainability, 19% of them an intermediate result was obtained because they have not been fully implemented. And finally, 14% reflects an unfavorable outcome in some institutions because they have not implemented the standards or rules necessary for the benefit of sustainability. Similarly, 100% of the institutions surveyed believe that social responsibility involves addressing local and regional issues to better sustainable development in the region and thus to promote a better culture among its inhabitants.

Regarding Shares for Sustainability 81% of higher education institutions if they know the initiatives implemented by the institution to which they belong and likewise promote projects with their pupils and students that will contribute in a better way to development sustainability, however 19% of them said they do not know any initiative or activity in their respective institution. Similarly, 100% agree on the importance comprising the implement development projects to improve sustainability, both in the institution and the region they inhabit. About 24% of the institutions surveyed responded that one of the biggest benefits is to obtain environmental certification.

Similarly different sustainable actions developed since 29% of the institutions carried out the action of separation of hazardous waste, as well as the other 29% makes the separation of organic, inorganic and battery waste, while 28 % implements the separation of PET, also 9% said they had other options such as reuse office paper, waste separation toner, the water is treated to irrigate the remaining 5% of the institutions carries out recycling Water.

In the last section Participation / Collaboration 71% of them answered that the degree of participation of students is between 51% to 75% of collaboration in the actions carried out within their institution, while 14% of them is on a scale from 26% to 50% of the contribution, on the other hand 10% said there is a high degree of participation and the percentage obtained was 76% to 100%, but 5% did not respond satisfactorily since the contribution of students is from 1% to 25%. Finally, 80% of the staff is working in the respective institutions from 51% to 75% staff participation engages in actions that are carried out to help sustainability,

According to the results obtained in this research the following table which highlights the strengths and weaknesses identified in the Institutions of Higher Education of the public and private sectors of the Sierra Norte de Puebla region is shown.

Strengths	Weaknesses
Knowledge of the term Sustainability.	Lack of implementation of the rules on sustainability in certain institutions.
Carry out actions for the development of Sustainability by most institutions.	Lack of financial resources to carry out the project.
Being aware of the benefit they attach to their region and locality.	Lack of time for students and staff to carry out all proposals for new projects.
Propose new projects or activities to undertake in improving sustainability.	Lack of environmental training.
Engage students and staff working in the institutions to carry out the proposed activities.	
Certification and accreditation of environmental standards.	
Agreements with companies and institutions.	

Table 5 Strengths and Weaknesses registered in Universities of Municipalities of the Sierra Norte de Puebla

Source: *self made*

Annexes

Key	Municipality	Total population	Urban population ZAP
006	Ahuacatlán	14,754	3,006
008	Ahuazotepec	10,457	1,268
014	Amixtlán	5,004	2,518
016	Aquixtla	7,848	456
028	Camocuahtla	2,476	1,412
030	Coatepec	758	681
039	Cuautempan	9,212	1,094
049	Chiconcuahtla	15,767	3,279
053	Chignahuapan	57,909	17,983
057	Honey	7,463	1,131
064	Francisco Z. Mena	16,270	3,934
068	Hermenegildo Galeana	7,718	1,165
071	Huauchinango	97,753	46,469
083	Ixtacamaxtitlán	25,326	0
086	jalpan	12,547	376
089	Jopala	12,997	5,094
091	Juan Galindo	10,213	4,292
100	Naupan	9,707	1,691
107	Olintla	11,641	1,889
109	Pahuatlán	20,618	6,202
111	Pantepec	18,435	5,113
123	San Felipe Tepatlán	4,120	434
162	Tepango Rodriguez	4,244	3,461
167	Tepetzintla	10,240	1,142
172	Tetela de Ocampo	25,793	1,952
178	Tlacuilotepec	17,115	1,685
183	Tlaola	19,826	10,172
184	Tlapacoya	6,406	621
187	Tlaxco	5,415	1,272
194	Venustiano Carranza	27,890	20,596
197	Xicotepc	75,601	48,583
200	Xochiapulco	3,911	1,066
208	Zacatlán	76,296	24,923
213	Zihuateutla	12,530	1,124
215	Zongozotla	4,599	4,266
	Total	668,859	230,350

Table 6 Municipalities that make up the Sierra Norte with population Total, color those in which higher education is offered

Source: *Based on data from the Regional Development Program 2011-2017 Sierra Norte region*

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Conclusions

both the institution and the region they inhabit; however only 86% of respondents there are rules or rules that favor the creation of policies in favor of this; Parallel almost 81% of higher education institutions if they know the initiatives that implement the institutions to which they belong and promote projects with their student bodies to contribute better to the development of sustainability. Regarding the benefits to be gained from sustainability actions 24% to achieve environmental certification, 24% chose achieve recognition by society 19% of these institutions preferred to raise awareness of current and future generations, 19 % Parallel almost 81% of higher education institutions if they know the initiatives that implement the institutions to which they belong and promote projects with their student bodies to contribute better to the development of sustainability.

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Equally apply various sustainable actions such as: Water Recycling, Separation of PET, separation of hazardous waste, separation of organic waste, inorganic and batteries. In addition to these actions take 71% of higher education institutions, with the participation between 51 and 75% of students and 81% last IES with the participation of its staff between 51 and 75%.

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